

## SIMPLIFYING RADICAL EXPRESSIONS

Perfect Squares: 1, 4, 9, 16, 25, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, 144...

$x^2, x^4, x^6, \dots$  Exponents must be \_\_\_\_\_.

$\sqrt{25}$  is read "the square root of 25".

$$\sqrt{25} = 5 \text{ because } 5^2 = 25 \quad \sqrt{36} = 6 \text{ because } \underline{\hspace{1cm}} = \underline{\hspace{1cm}} \quad \sqrt{100} = \underline{\hspace{1cm}} \quad \sqrt{49} = \underline{\hspace{1cm}}$$

$$\sqrt{a^6} = a^3 \text{ because } (a^3)^2 = a^6 \quad \sqrt{m^{16}} = m^8 \text{ because } \underline{\hspace{1cm}} = \underline{\hspace{1cm}} \quad \sqrt{y^{10}} = \underline{\hspace{1cm}} \quad \sqrt{a^2} = \underline{\hspace{1cm}}$$

Hint: Divide the exponent by \_\_\_\_\_.

In the expression  $\sqrt{a}$ , the  $\sqrt{\hspace{0.5cm}}$  is called the radical and  $a$  is called the radicand.

### Simplify (Simplifying Perfect Squares):

1.  $\sqrt{4}$
2.  $\sqrt{16}$
3.  $-\sqrt{100}$
4.  $\sqrt{a^8}$
5.  $\sqrt{w^{12}}$
6.  $\sqrt{a^6 b^{10}}$
7.  $\sqrt{9a^2}$
8.  $-\sqrt{81m^{64}}$
9.  $\sqrt{49a^4 b^{12}}$
10.  $\sqrt{121x^{14} y^6}$

### Simplify (Simplifying Radicals that are not Perfect Squares):

1.  $\sqrt{20} = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$
2.  $\sqrt{27} = \sqrt{9}\sqrt{3} = 3\sqrt{3}$
3.  $\sqrt{48} = \sqrt{16}\sqrt{3} = 4\sqrt{3}$
4.  $\sqrt{45} = \sqrt{\hspace{0.5cm}}\sqrt{\hspace{0.5cm}} = \underline{\hspace{1cm}}\sqrt{\hspace{0.5cm}}$
5.  $\sqrt{12} = \sqrt{\hspace{0.5cm}}\sqrt{\hspace{0.5cm}} = \underline{\hspace{1cm}}$
6.  $\sqrt{50} = \underline{\hspace{1cm}}$
7.  $\sqrt{a^5} = \sqrt{a^4}\sqrt{a} = a^2\sqrt{a}$
8.  $\sqrt{x^9} = \sqrt{\hspace{0.5cm}}\sqrt{\hspace{0.5cm}} = \underline{\hspace{1cm}}$
9.  $\sqrt{x^3} = \underline{\hspace{1cm}}$

### Simplify:

1.  $\sqrt{18}$
2.  $\sqrt{125}$
3.  $\sqrt{72}$
4.  $\sqrt{180}$
5.  $\sqrt{a^3}$
6.  $\sqrt{b^7}$
7.  $\sqrt{m^{11}}$
8.  $\sqrt{75x^7 y^5}$
9.  $\sqrt{27a^{11} b^7}$
10.  $\sqrt{32a^7 b^4}$
11.  $\sqrt{9a^8}$
12.  $\sqrt{45a^7}$
13.  $\sqrt{36x^2 y^6}$
14.  $\sqrt{12x^{20} y^8}$
15.  $-\sqrt{200}$
16.  $\sqrt{196}$
17.  $\sqrt{63x^4 y}$
18.  $\sqrt{6x^3}$
19.  $\sqrt{100x^5 y}$
20.  $\sqrt{80x^{100} y^{49}}$

## Homework Simplifying Radicals

Name \_\_\_\_\_

Class Time \_\_\_\_\_

Simplify each of the following expressions completely.

\_\_\_\_\_ 1.  $\sqrt{64}$

\_\_\_\_\_ 2.  $-\sqrt{18}$

\_\_\_\_\_ 3.  $\sqrt{32}$

\_\_\_\_\_ 4.  $\sqrt{50}$

\_\_\_\_\_ 5.  $\sqrt{400}$

\_\_\_\_\_ 6.  $\sqrt{x^6}$

\_\_\_\_\_ 7.  $\sqrt{x^7}$

\_\_\_\_\_ 8.  $\sqrt{16x^{16}}$

\_\_\_\_\_ 9.  $\sqrt{9x^9}$

\_\_\_\_\_ 10.  $\sqrt{40x^8}$

\_\_\_\_\_ 11.  $\sqrt{25x^7}$

\_\_\_\_\_ 12.  $\sqrt{12x^5}$

\_\_\_\_\_ 13.  $\sqrt{a^2b^4}$

\_\_\_\_\_ 14.  $\sqrt{49a^8x^{12}}$

\_\_\_\_\_ 15.  $\sqrt{28x^9y^6}$

\_\_\_\_\_ 16.  $\sqrt{32m^7n^{11}}$

\_\_\_\_\_ 17.  $\sqrt{20x^{10}y^5}$

\_\_\_\_\_ 18.  $\sqrt{100ab^4}$

\_\_\_\_\_ 19.  $\sqrt{75x^8y^3}$

\_\_\_\_\_ 20.  $\sqrt{98x^7y^5}$